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COMPARING FIRST AND SECOND GENERATION DIGITAL NATIVE'S INTERNET USE, INTERNET ANXIETY AND INTERNET IDENTIFICATION

ABSTRACT

The aim of the study was to compare first and second generation Digital Natives' attitudes towards and use of the Internet. The sample of first generation Digital Natives consisted of 558 students who we surveyed in 2002 and who were born after 1980. The sample of second generation Digital Natives consisted of a sample of 458 students who we surveyed in 2012 and were born after 1993. They completed a questionnaire in the first semester of their first academic year and consisted of a measure of Internet experience, an Internet anxiety scale and an Internet Identification scale. Second generation Digital Natives' had more positive attitudes towards the Internet than first generation Digital Natives. They had higher scores on the Internet Identification scale and lower scores on the Internet Anxiety scale compared with first generation Digital Natives. Furthermore, we found that second generation Digital Natives used the Internet more than first generation Digital Natives. Email was the most popular activity for both generations, although second generation Digital Natives used it significantly more than first generation Digital Natives. SNS emerged as a very popular activity for second generation Digital Natives. Both generations reported low use of Web 2.0 technologies.

INTRODUCTION

In 2001, Prensky^{1,2} argued that a new generation of technologically literate young people were entering university who he termed Digital Natives. He went on to say that this generation was fundamentally different from previous generations. They have 'spent their entire lives surrounded by and using computers and videogames, digital music players, videocams, cell phones and all other toys and tools of the digital age' (p1) and this has changed the way they think. He claims these students have a natural technological affinity and digital literacy; they prefer receiving information quickly, are adept at processing information rapidly, prefer multi tasking and non-linear access to information, have a low tolerance for lectures, prefer active rather than passive learning and rely heavily on communications technology to access information and to carry out social and professional interactions^{1,2}.

There have been a number of studies which have investigated these claims³⁻⁹. Studies have shown that the access and use of technology is very high amongst young people³ and they have more positive attitudes towards technology than older people^{4,5}, but other studies have reported that the use of more advanced technologies was not as high as expected⁹ and there was considerable variation amongst young people⁷. Very few studies have compared the use of digital technology across two different generations of young people. The Educase Center for Applied Research has conducted large scale surveys of undergraduate students' use of technology every year since 2004⁹⁻¹⁵. The 2010 report¹⁴ is a survey of 36,950 students and they reported that communication technologies dominate students use of IT and the use of SNS has increased significantly over recent years to almost universal levels. Web 2.0 services are still a minority activity even in 2010 with 42% contributing to video sharing websites, 40% contributing to wikis and 36% to blogs. Judd &

Kennedy¹⁶ reported a large scale study of Australian biomedical students' actual Internet use between 2005 until 2009. They reported that students were most frequent users of the university's learning management system, Internet search engines, email and SNS. Email was very popular, although its use had declined between 2005 and 2009. There was a rapid increase in the use of SNS between 2006 and 2007, however, students' use of other Web 2.0 technologies was low across the 5 year period.

Prensky defined a Digital Native as anybody who was born after 1980¹. However, the Internet has changed considerably since then, especially with the introduction of Web 2.0 technologies and a number of commentators have argued that it is more appropriate to talk of first and second generation Digital Natives, with the second generation of Digital Natives defined as anybody who is born after 1993. They have been termed the Google Generation¹⁷ and the i-Generation¹⁸. They are often seen as the real Digital Natives¹⁹ because they have grown up with Web 2.0 technologies. Therefore, we aim to test if there were differences in attitudes and use of the Internet between first and second generation Digital Natives. We would predict that second generation Digital Natives will have more positive attitudes and use the Internet more than first generation Digital Natives.

METHOD

Participants

The first generation Digital Natives were 558 psychology undergraduate students (448 females and 110 males) who we surveyed in 2002 and who were born after 1980. They were from six universities across the UK and their mean age was 19 years ($SD = 1.5$). The second generation of Digital Natives were 458 first year psychology undergraduate students (362 females and 88 males, 8 participants did not specify their gender) who were born after 1993 and were surveyed in

2012. They were from six UK universities and their mean age was 19 years ($SD = 1.3$). The sample in 2012 was chosen to match as closely as possible the sample taken in the 2002 by using where possible the same universities that we used in 2002.

Procedure and Measures

We surveyed the students' use of and attitudes towards the Internet in the first semester of their first year of university. In 2002, the measure of students' use of the Internet consisted of nine items (see Table 1 for the full list). They answered using a five point scale (never, once a week, several times a week, once a day and several times a day - $\alpha = 0.90$). They were also asked to list any activities they used the Internet for but which were not listed above. In 2012, the measure contained 24 items (see table 2 for the full list). They answered using a six point scale (never, less than once a week, once a week, several times a week, once a day and several times a day - $\alpha = 0.90$). To make the 2012 scale directly comparable to the 2002 scale, it was collapsed into a five point scale, with 'never' and 'less than once a week' collapsed into one category relabelled 'never'.

Students then completed an Internet anxiety scale ($\alpha = 0.80$), which consisted of six questions answered using a five point Likert Scale (1 = strongly disagree to 5 = strongly agree). The Internet anxiety scale was based on the Clinical Computer Anxiety Scale²⁰ and scores above 70% are considered technophobic. The final part of the questionnaire was an Internet identification scale ($\alpha = 0.77$), which consisted of ten items answered using a five point Likert Scale (1 = strongly disagree to 5 = strongly agree). For a full description of both scales see Joiner et al.^{21,22}.

RESULTS

We found, as expected, that second generation Digital Natives had more positive attitudes towards the Internet than first generation Digital Natives. They had significantly lower Internet anxiety scores ($t = 9.8$, $p < 0.05$, $d = 0.59$). The mean for second generation Digital Natives was 11.7 ($SD =$

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2.3), compared with a mean of 13.6 ($SD = 3.6$) for first generation Digital Natives. There were 21 first generation Digital Natives who were classified as technophobic, however there were no second generation Digital Natives who were classified as technophobic. Furthermore, second generation Digital Natives had a significantly higher Internet Identification score than first generation Digital Natives ($t = 12.6$, $p < 0.05$, $d = 0.80$). First generation Digital Natives had a mean of 2.7 ($SD = 0.5$) compared to second generation Digital Natives who had a mean of 3.1 ($SD = 0.4$). See Joiner et al.^{24,25} for a discussion of the relationship between the students attitudes and internet use

We also found that second generation Digital Natives were using the Internet more than first generation Digital Natives (see tables 1 and 2). They were engaging in more Internet activities and engaging in them more frequently. Email was the most popular Internet activity for both first and second generations of Digital Natives, however the modal score for second generation Digital Natives was significantly higher than the modal score for first generation Digital Natives ($t = 26.4$, $p < 0.05$, $d = 1.7$). SNS was a very popular activity for second generation Digital Natives. In 2002, we did not directly ask how frequently they used a SNS, but there was an open ended question where students could list any activities they used the Internet for but which we had not included. No first generation Digital Natives listed using any SNS. The Internet was also being used more for entertainment by second generation Digital Natives than by first generation Digital Natives. Second generation Digital Natives were using it more frequently for watching television and listening to music.

Table 1 and 2 also reveal a number of interesting similarities between the two generations. The first is that both first and second generation Digital Natives only use the Internet for a small number of activities and these are primarily for social and entertainment purposes. The modal scores in both

tables show that students are not regularly using the Internet for a whole range of activities. For first generation Digital Natives only a third of the activities had a modal score of greater than 'once a week'. For second generation Digital Natives only 5/24 of the activities had modal score of greater than 'once a week'. Furthermore, some of the least popular activities have often been associated with Digital Natives. Only 27.4% of students used microblogging websites, 18.8% played games online and only 1.5% visited virtual worlds.

Insert table 1

Insert table 2

DISCUSSION

The aim of this study was to compare the attitudes and uses of the Internet of first generation Digital Natives with second generation Digital Natives. We found that second generation Digital Natives had higher Internet Identification scores and lower Internet Anxiety scores than first generation Digital Natives. In fact, no second generation Digital Natives were classified as technophobic, whereas 21 first generation Digital Natives were classified as technophobic. Furthermore, second generation Digital Natives used the Internet more than first generation digital Natives. They engaged in more activities on the Internet and they engaged in them more frequently. For example email was the most popular Internet activity for both first and second generation Digital Natives, but second generation Digital Natives were using it significantly more than first generation Digital Natives. They were also using the Internet more for entertainment purposes than first generation Digital Natives. Use of SNS emerged as second most popular activity for second generation Digital

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Natives, but no first generation Digital Natives even mentioned it in 2002. Both first and second generation Digital Natives only used the Internet for a small range of Internet activities, mostly for social and entertainment purposes, which is consistent with previous research on first generation Digital Natives⁴. Other than SNS, most students were not using Web 2.0 technologies (i.e. microblogging or visiting virtual worlds).

The finding that students' attitudes towards the internet were higher for second generation digital natives compared with first generation digital natives was expected and can be explained because of the ubiquitous and pervasive nature of the technology this generation has grown up with. This explanation is supported by our finding that second generation digital natives are using technology significantly more than first generation digital natives and is also consistent with previous research¹⁴. The other finding which was less expected was the low use of Web 2.0 technology. Prensky^{1,2} and others had commented that these two digital generations would be make considerable use of this technology. Our finding does not support this and is consistent with previous research which has also reported a low use of web 2.0 technologies by students^{14,16}.

One of the main limitations with this research is the large number of female students in our sample, which could partly explain the findings. Our previous research has demonstrated that the type of Internet activities students reported using were influenced by gender^{22,23}, with females using the Internet more for communication and males using the Internet more for games and entertainment. Further research is required on a more representative sample to see if these findings are an artefact of this particular sample or a more general phenomenon. However, until such research is conducted it appears, at least for the moment, that there is no great universal adoption of web 2.0 technologies by first or second generation Digital Natives, with the notable exception of SNS.

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